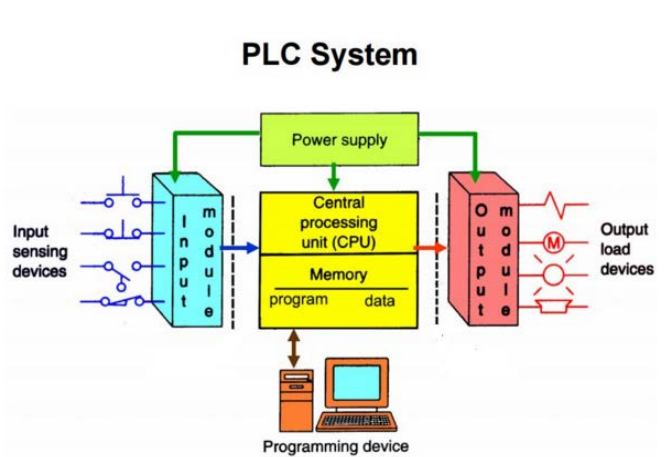


Sheet (1)

1- What is meant by PLC?

A programmable logic controller (PLC) is an industrial computer control system that continuously monitors the state of input devices and makes logic-based decisions based upon a custom program to control the state of output devices.

2- What is inside a PLC?



3- What is meant by ON-OFF controllers?

Sometimes, the control element has only two position either it is fully closed or fully open (1 or 0) (energized or de energized). This control element does not operate at any intermediate position, i.e. partly open or partly closed position. This type of controllers is known as on-off controllers or two position controllers. As Examples of these controllers:

- Programmable Logic Controller (PLC)
- Microcontrollers

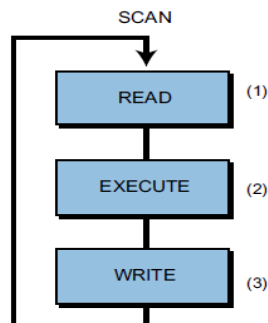
4- List some applications of PLCs.

- Production lines
- Elevators
- Escalators
- Traffic Control
- Robot:
 - Toxic chemical materials spraying robot
 - Skyscrapers glass washing robot

5- Explain the operation of a PLC.

During the PLC operation, the CPU completes three sequential processes:

Read (Input Scan), Execute (Program Scan), and Write (Output Scan)



➤ 1) Read:

Detects the state of all input devices that are connected to the PLC

➤ (2) Execute:

Executes the user control program stored in the memory

➤ (3) Write:

Updates (energizes or de-energize) all output devices that are connected to the PLC.

c. Structured Text (ST)

A high level text language that encourages structured programming. It has a language structure (syntax) and supports a wide range of standard functions and operators.

```
If Speed1 > 100.0 then
    Flow_Rate: = 50.0 + Offset_A1;
Else
    Flow_Rate: = 100.0; Steam: = ON
End_If;
```

d. Instruction List (IL)

A low level language “like assembly language” that is based on similar instructions list languages found in a wide range of today’s PLCs.

Instruction	Description
LD	: load input
LDI	: load inverse input
OR	: or wit = branching = parallel
ORI	: or inverse with
AND	: and with = series
ANI	: and inverse with
OUT	: out to

7- What are inputs and outputs Devices connected to a PLC?

Input Devices	Output Devices
Toggle Switch	Control relays
Push button Switch	Motor
Selector Switch	Solenoids
Temperature Switch	Valves
Limit Switch	Alarms
Liquid Level Switch	Fans
Relay Contacts	Lights

Photoelectric Sensors (Photo Sensors)	
Pressure Switch	

8- What do i need to consider when choosing a PLC?

- Will the system be powered by AC or DC voltage?
- Does the PLC have enough memory to run my user program?
- Does the system run fast enough to meet my application's requirements?
- What type of software is used to program the PLC?
- Will the PLC be able to manage the number of inputs and outputs that my application requires?
- How am I going to communicate with my PLC?
- Do I need network connectivity and can it be added to my PLC?